

EUROSAFE Forum 2012

Brussels - 5/11/2012

Welcome address

Benoît De Boeck (Bel V)

Good afternoon, Ladies and Gentlemen. It is my pleasure to welcome you for the third Eurosafe Forum in Brussels.

You may have noted a change in the programme compared to previous editions: there is no panel discussion. The programme Committee decided to replace the panel by a question and answer time. If you happen to have a question for one of the speakers of the plenary, please put it down on the forms that you have been given. They will be collected by our hostesses, screened by a few voluntaries of the programme committee, and hopefully addressed after the second break.

You may remember that 3 years ago we had Dirk Frimout, the first Belgian astronaut, as a guest speaker. This time we will be taken to the solar system by Yaël Nazé, an astrophysicist of the University of Liège. She doesn't travel physically to space but with the help of telescopes she brings back beautiful images of distant bodies, and by her research, she improves our understanding of the universe. I hope you will like her lecture.

The theme of the Forum of this year is "Towards enhanced robustness in nuclear safety". Why this subject?

The first obvious answer is that after Fukushima and the stress tests, the need was felt to increase the robustness of our nuclear power plants and other nuclear installations against a spectrum of external events. This is why we invited Philippe Jamet, the big boss of the European stress tests, to present the process and the outcome of this activity.

As a matter of fact, the risk of external events has clearly been underestimated in the past. We knew that at some plants the probability of beyond design external hazards, like flooding, earthquake, or tsunamis, were 100 of 1000 times higher than specific design basis internal initiating events. We engineers, we like to discuss pumps, valves, and system behaviour. We therefore did a lot of work to improve the prevention and mitigation measures for severe accidents initiated by internal failures.

My impression today is that this behaviour conducted to disequilibrium in the risk pie chart of our nuclear installations. Yes we can do better!

But there is also another reason for the choice of the theme of this year's forum. The operating nuclear power plants were designed using an assumed life time of 40 years, usually. We know that this duration is conventional and that in most cases nothing stands in the way of longer safe operation. However safety expectations are increasing with time; and this is true also for a number of other human activities like transportation or safety at the work place.

This explains why increased robustness is also an issue in the frame of the justification for long term operation, and this will be the subject of 2 of this afternoon papers: one from a utility perspective and one from a TSO perspective.

What do we mean by “robustness”? In the frame of this forum we want to use a broad definition. We do not only mean strong and firm structures, or tough and reliable systems. We mean the whole process by which an installation has built-in capabilities to convincingly face a wide spectrum of initiating events and conditions. It therefore covers diversity and redundancy. It covers the defence in depth concept. It rests on the provisions of adequate design margins.

But it also means that the safety demonstration should not be too dependent on particular assumptions or on details of the models. We know that it is not possible to test structures, systems and components in all conditions that they may encounter during accidents. The safety case therefore relies on models that have been validated based on test data. Margins to cover uncertainties are taken into account, but robustness goes one step further: it is a process by which we try to answer questions like:

- What if the model does not fully represent reality?
- What if the real parameters deviate from the expected values?
- What if the initiating event goes beyond what was assumed?

A robust installation, where an answer to such questions is available, is therefore not too sensitive on changes in requirements; it is able to resist a wide spectrum of events. When new knowledge is generated by research, when new insights come from experience feedback, when past practice is not found acceptable anymore, a robust design does not need to undergo profound changes, or be scraped.

Future plants will have to incorporate more robustness in the design because they are designed for a longer lifetime. This is especially true for innovative concepts, as will be explained in the paper about the MYRRHA project.

Robustness is a “soft” concept, like safety. The same question therefore arises: how robust is robust enough? I do not think that we will have the answer by tomorrow evening, but I do hope that we will have made progress, and I therefore wish you a fruitful conference.